



2012 WR450F Technical Summary



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WR450F Development Themes

The development / concept theme for the latest generation WR450F is :

- Improved horsepower , torque and engine response (FI system)
- Ease of handling on tight trails (Bilateral Beam frame)
- Improved function for rough trail and competition use (YZ "SSS" 48mm inverted fork)
- New more aggressive & tough styling

Good cornering & suspension performance = racing success !!

Here's why...

Good cornering & suspension...

- Lets the rider get on the gas sooner
- Makes the bike easier to ride
- Makes the bike less tiring to ride ... improving rider stamina



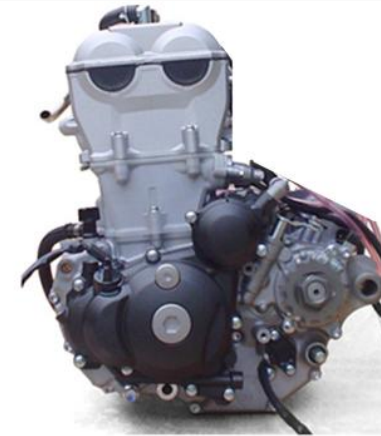
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WR450F background – key items

Engine:

2012 engine is based on existing 5TJ power plant ... 5-valve design

- Addition of fuel injection
- Numerous other changes
- Excellent reputation for durability & reliability



Chassis:

- New YZ250F based "Bilateral Beam" frame
- New YZ based suspension
 - KYB 48mm adjustable, inverted "Speed Sensitive System" (SSS) fork
 - Fully adjustable piggy back shock
- New YZ250F inspired bodywork

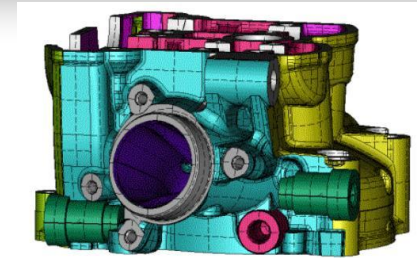


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5- Valve Cylinder Head

5-valve combustion chamber design with optimized port shapes for excellent flow characteristics. The 5-valve design features 3 intake valves and 2 exhaust valves.

Lightweight titanium valves (intake & exhaust) and load-reduced valve springs reduce reciprocating mass by up to 40% over conventional steel valves.



5-valve cylinder head benefits:

1. Excellent “breathing” efficiency (increased valve area improves intake & exhaust flow)
2. Allows a higher rpm limit because smaller, lighter valves have less risk of valve float (valve float is one of the determining factors in setting a redline)
3. Excellent power delivery
4. Reduces cam wear



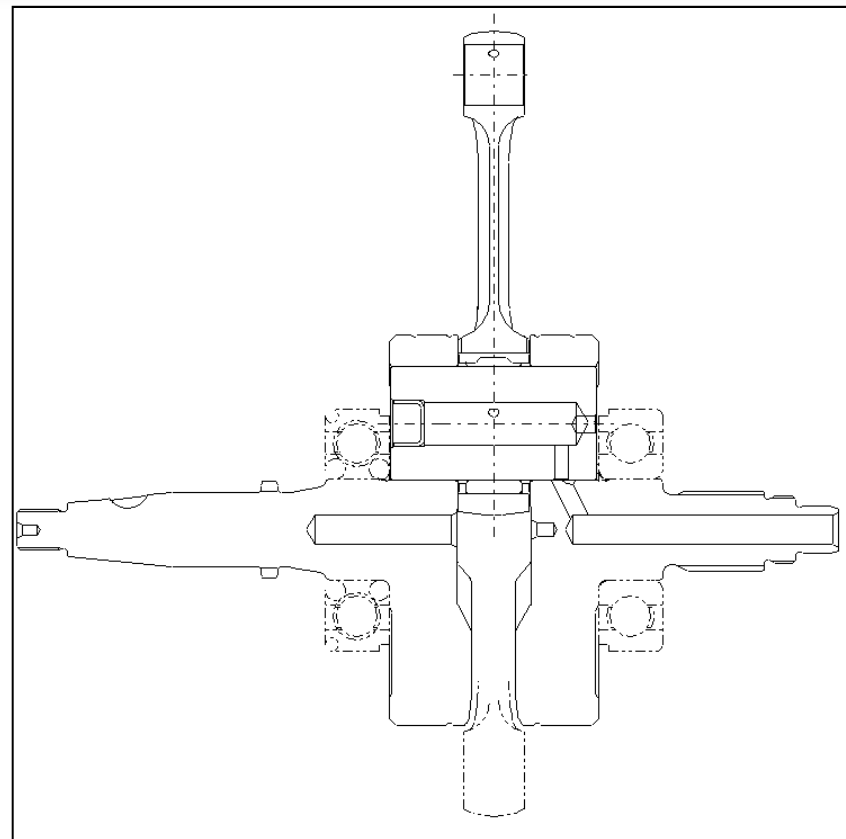
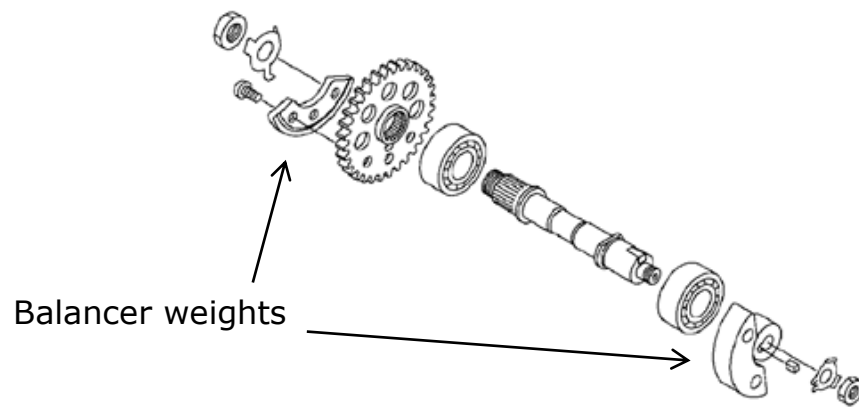
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Crankshaft & balancer shaft

The WR450F utilizes a roller bearing style crankshaft with an engine counter balancer shaft. The width of the big end rod bearing has been increased.

Crankshaft benefits:

1. Excellent durability & reliability. This is a proven engine design
2. Reduced vibration (especially in the handlebars)



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5-speed wide ratio transmission

The WR450F features a wide ratio 5-speed transmission and multi-plate wet clutch.

5- speed transmission benefits:

1. Good acceleration and top end speed
2. Excellent versatility (hare scrambles, super moto, ice racing etc.)



gear	ratio	# of teeth
1 st gear	2.417	29/12
2 nd gear	1.733	36/15
3 rd gear	1.313	21/16
4 th gear	1.050	21/20
5 th gear	0.840	21/25

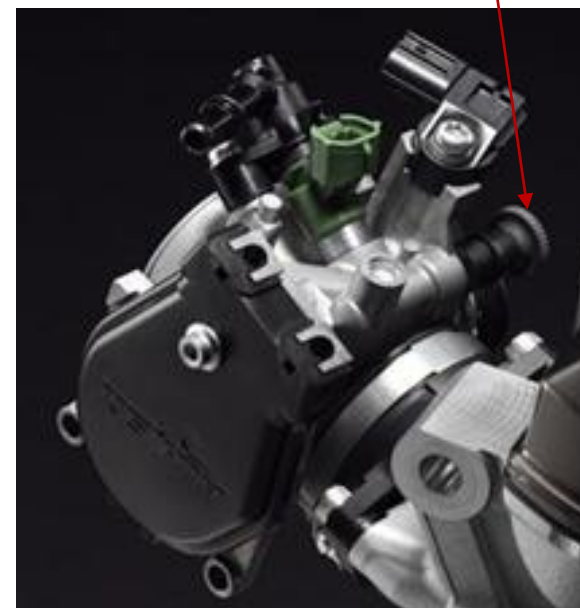
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Throttle body fuel injection

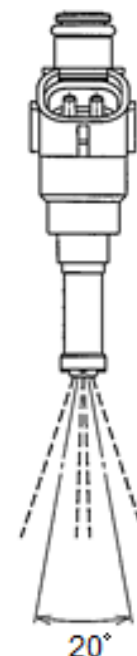
The WR450F features a 42mm Keihin throttle body fuel injection system utilizing a 12-hole injector for superb fuel atomization at all altitudes, and over a wide range of temperatures for outstanding throttle response. This is an open loop system. The system utilizes a cold start knob which doubles as an idle adjuster too. ACM output has been increased to accommodate the FI system

Fuel injection benefits:

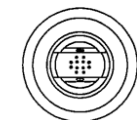
1. Automatically provides optimum fuel / air ratio regardless of altitude and temperature ... with no manual re-jetting required
2. Improved throttle response and a more linear throttle control
3. Reduced fuel consumption (fuel tank capacity = changed from 7 L to 6L)
4. Adjustable design allows for tune ability to suit riding skill, riding style and track conditions



Injector



12 holes



NOTE: The fuel injection system can NOT be manipulated without the use of the kit ECU ...

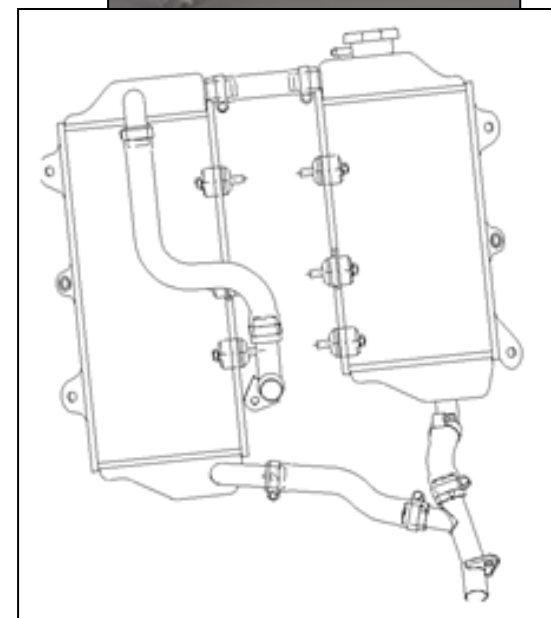
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Cooling System

The design of the rad is new and the capacity has been increased by 5%. The rads feature wider cores and improved shock resistance. Total rad capacity is 1.4 litres.

Cooling system benefits:

1. Excellent cooling
2. Improved protection in the event of a crash



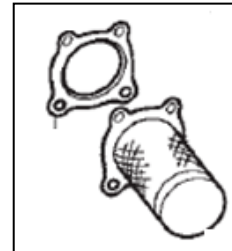
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Exhaust System

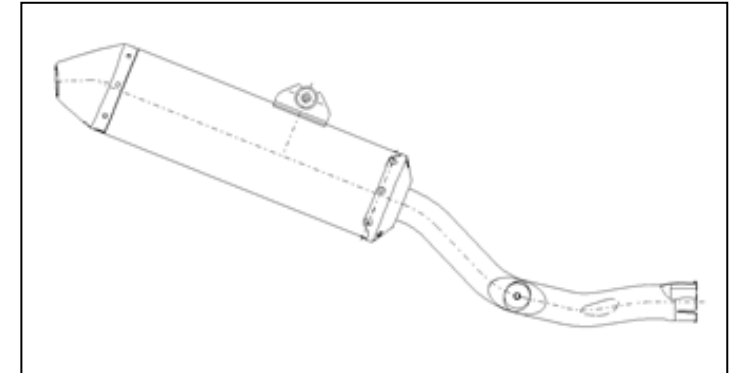
The stainless steel exhaust "header" features a resonator chamber that efficiently scavenges exhaust gasses and helps to create a more efficient exhaust pulse. The muffler features aluminum construction and a USFS approved spark arrestor

Exhaust system benefits:

1. Resonator chamber improves low to mid range power
2. Spark arrestor prevents stray sparks from exiting the exhaust system
3. Light weight design reduces weight

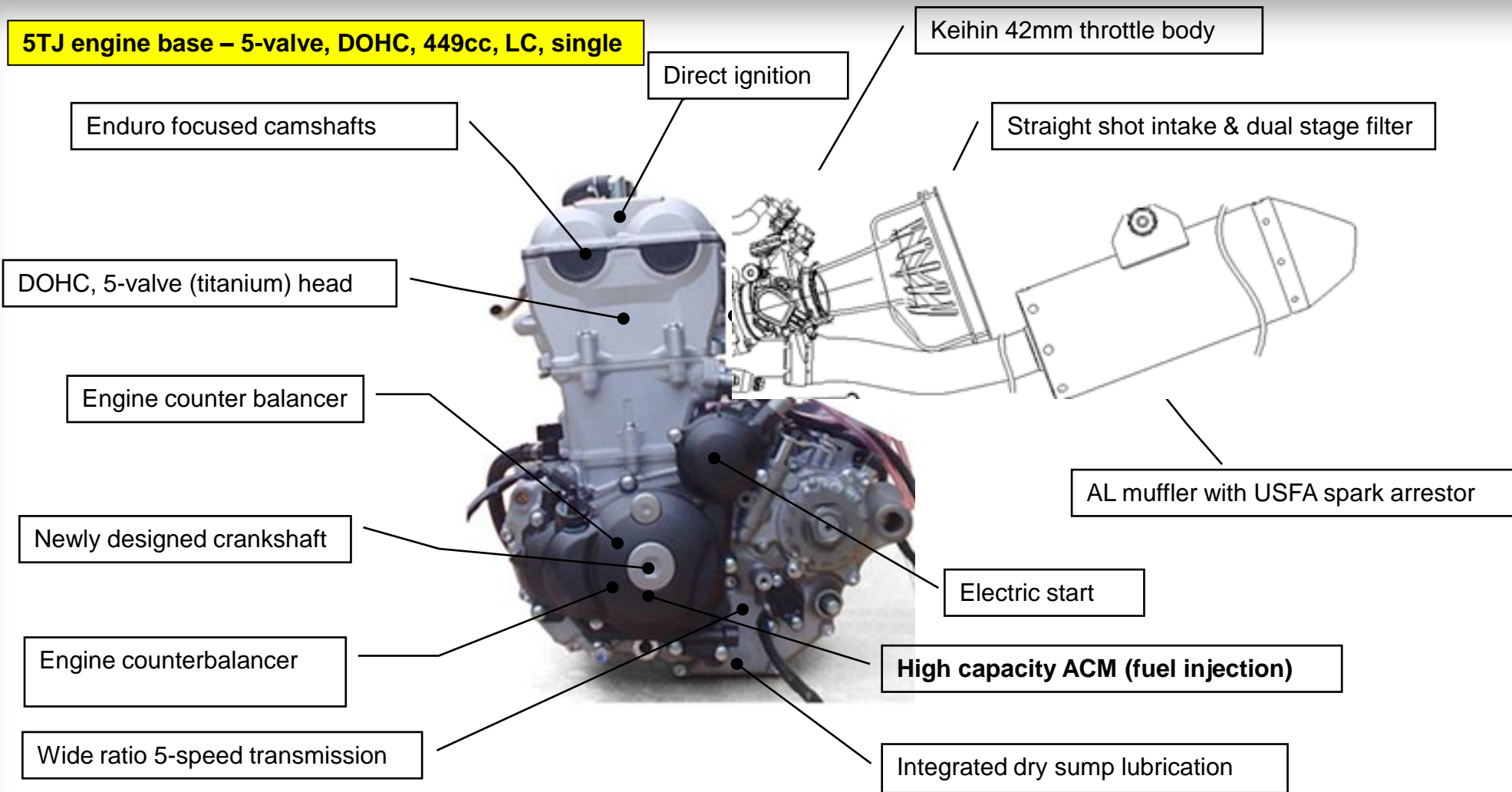


Spark
arrestor



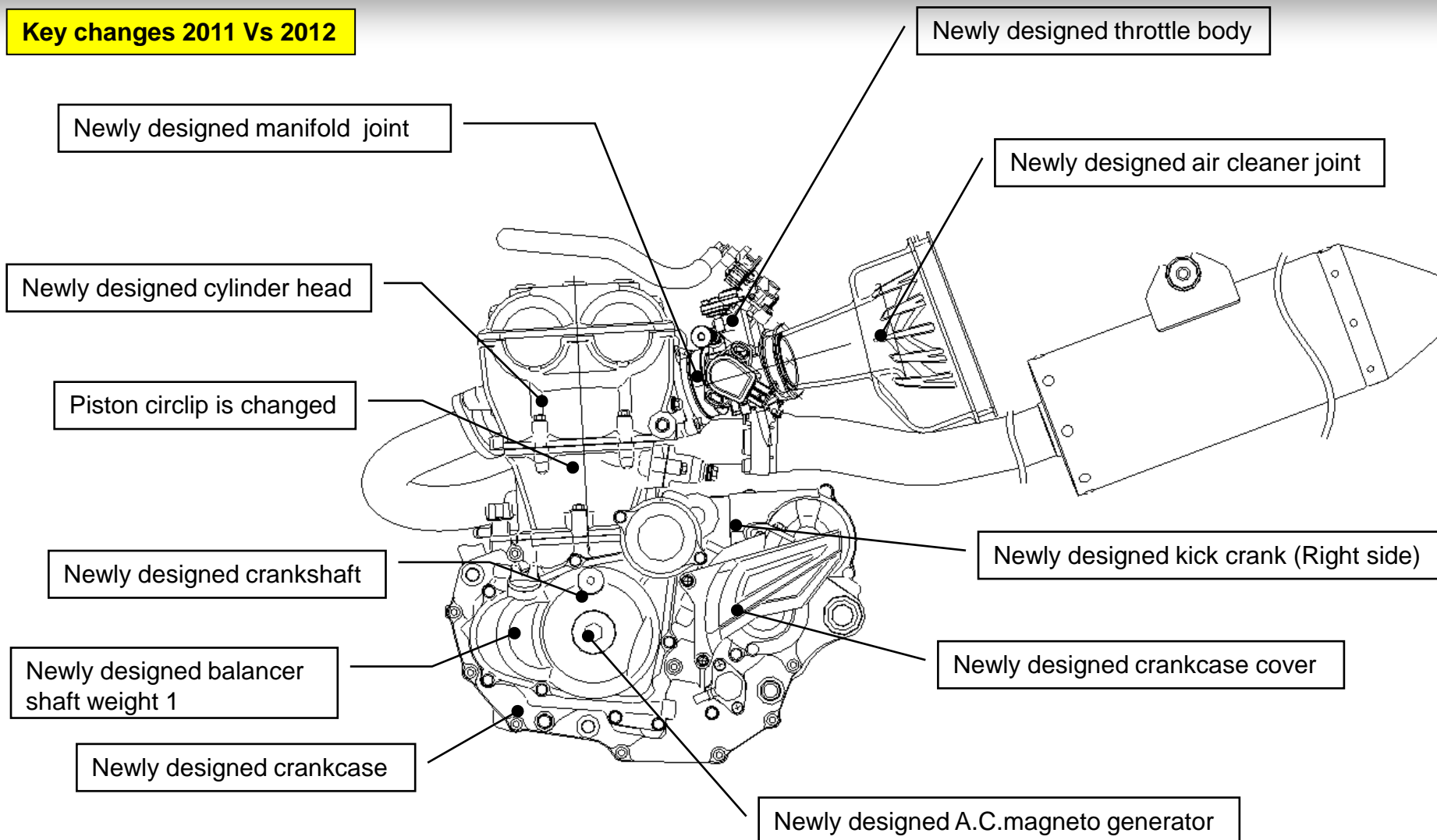
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5TJ engine base – 5-valve, DOHC, 449cc, LC, single



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Key changes 2011 Vs 2012



Competition kit ECU & Power Tuner

IMPORTANT WARNING:

The WR450F is classified as a "restricted use motorcycle" in Canada and as a result, must conform to Environment Canada / US EPA emission standards for "restricted use motorcycles." It is illegal to modify this type of unit unless it will be used for closed course competition only. Any alteration of emission related components constitutes illegal tampering and can lead to significant fines & other penalties

With the installation of optional GYTR **competition use only** kit ECU (p/n = 1DX-H59C0-V0-00), the WR450F fuel and ignition mapping can be adjusted with the use of the GYT-R Power Tuner. The Power Tuner will NOT work with the stock ECU.



GYTR® Competition ECU Kit
1DX-H59C0-V0-00
MSRP: \$119.95



GYTR® Power Tuner
33D-859C0-10-00
MSRP: \$329.95

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Special Tuning Feature

GYTR Power Tuner

This hand held, plug & play FI tuning tool allows riders or tuners to quickly adjust the fuel and ignition maps on the WR450F to suit track layout, track surface conditions (mud, hard pack loamy etc.) and skill level.

Allows 9 easy-to-program adjustment points for **both** the fuel duration and ignition maps. 18 adjustment points in total

Powered by 2 AA batteries, no laptop or time consuming downloads are necessary. Able to load and / or save maps in seconds. Maps can be shared between other WR450F owners.

FI Power Tuner benefits:

1. Allows rider or tuner to “tailor “ engine characteristics to suit track, track conditions, and rider skill level
2. Easy to connect to the machine ... plug in “port” in front of fuel tank
3. Easy to re-set back to factory settings
4. No lap top or outside power source required ... plug and play

GYTR Power Tuner



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WR450F Frame Design – part #1

Yamaha engineers identified **mass centralization** as one of the keys to great handling. The WR450F features a “Bilateral Beam” compact aluminum frame based on the YZ250F.

Mass centralization places the mass (or weight) in the best location. On a motorcycle it is in the centre of the machine between the wheels and should be as low as possible (which is a difficult task on a WR or YZ due to suspension & ground clearance requirements)

“Where possible, keep the heavy stuff in the centre of the bike and put the lighter stuff at the ends, also keep it as low in the chassis as possible”

Mass centralization benefits:

1. Light weight feeling
2. Quick & agile handling – less effort to initiate a turn
3. More precise steering & turning
4. Fast, easy direction changes
5. Improved rider feedback



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WR450F Frame design – part # 2

“Bilateral Beam” compact aluminum frame:

- Frame design allows for excellent mass centralization
 - fuel tank sits inside the main frame rails ... centralizing mass
- Frame offers outstanding shock absorbing qualities
- Frame consists of forged and extruded aluminum parts
- Unique double S bend main beam design provides ideal rigidity balance
- Rear sub lightweight aluminum is removable

Mass centralization benefits:

1. Light weight feeling
2. Quick & agile handling – less effort to initiate a turn
3. More precise steering & turning
4. Fast easy direction changes
5. Improved rider feedback

Removable sub frame benefits:

1. Easy suspension & air box access
2. Less costly repair in the event of a loop out



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Front suspension

The 2012 model year and onwards the WR450F features Yamaha's latest MX fork technology ... the twin chamber "Speed Sensitive System" (SSS), 48mm, adjustable, inverted fork. Without getting into too much detail, the damping force is controlled by the speed of the internal fork piston ... not its position. More simply, the faster the internal piston in the fork moves, the harder the damping resistance becomes.

Adjustments include 20 clicks of compression damping and 20 clicks of rebound damping.

48mm inverted Speed Sensitive System fork benefits:

1. Excellent all round suspension function ... whether big or small bumps
2. Speed sensitive design provides a rising rate suspension function
3. Excellent suspension controllability in the most challenging situations
4. This industry leading suspension makes the WR450F more versatile (enduros, hare scrambles, cross country, super moto, and ice racing)
5. Adjustable design allows rider to "tailor " suspension to suit ; rider weight, track conditions, riding style, rider skill level



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Suspension - rear

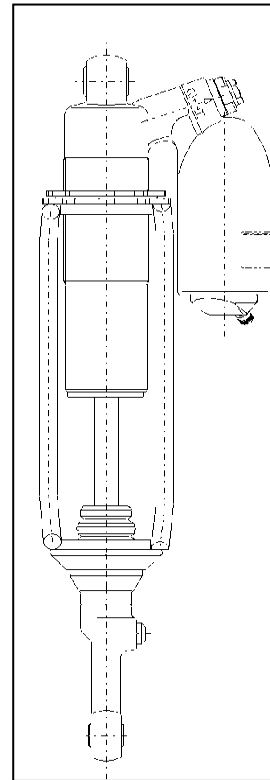
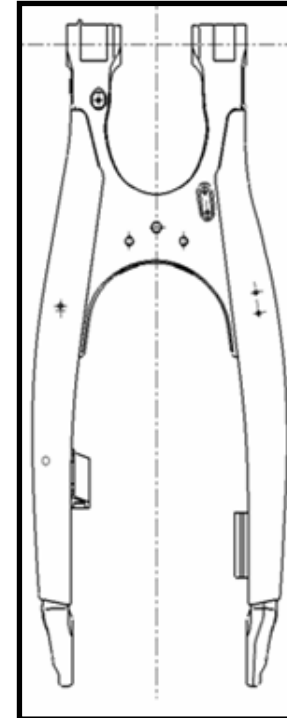
Swingarm and KYB® Rear Shock

The KYB® rear shock is aligned with the central axis of the Bilateral Beam frame and the shock & linkage has been moved closer to the middle of the chassis for mass centralization.

The KYB® 4-way fully adjustable piggyback rear shock features a large 50mm piston to provide to provide consistent damping control. Adjustments include spring pre-load (threaded type), high speed compression damping (2 turns), low speed compression damping (20 clicks) and rebound damping (30 clicks).

4-way adjustable rear suspension benefits:

1. Adjustability allows rider to “tailor” settings to match rider weight, rider skill , rider style and track conditions
2. New more forward linkage position centralizes mass for improved handling



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Brakes

The WR450F utilizes a floating 250mm front wave style rotor squeezed by a twin piston Nissin caliper. The rear 245mm wave style rotor is squeezed by a single piston Nissin caliper.

Brake benefits:

1. Excellent braking performance
2. Good lever feel and feedback to the rider
3. Wave style rotors reduce weight and dissipate heat better than a conventional round disc (more surface area)



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Instrumentation

The WR450F features a compact, lightweight instrument assembly. It features 2 different modes:

- 1) Basic mode:** speedometer, clock, dual tripmeters, and clock
- 2) Race mode:** timer (accumulates time from zero ... counts upwards, Tripmeter: works with timer & shows distance travelled since the timer started and tripmeter adjustment (allows rider to add or remove "mileage" from the tripmeter as required)

You use these select and reset buttons to adjust the meter assembly and change between the 2 modes



Instrumentation benefits

1. Easy to use
2. Compact (small size) design helps to prevent damage and reduces weight
3. Info is available with a quick glance

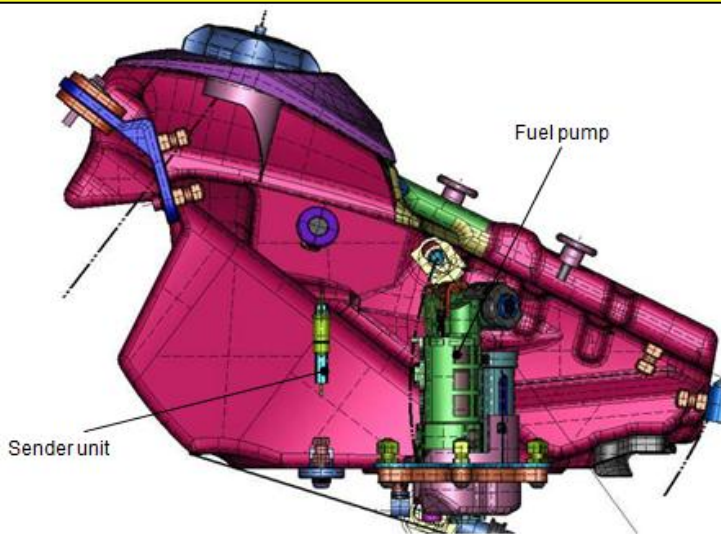
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Fuel Tank

The slim design 7.2 litre plastic resin fuel tank sits down between the top frame rails and extends underneath the seat, toward the machine's center point. An electric fuel pump is located inside the tank.

Fuel tank location - benefits:

1. Centralizes mass for great handling
2. Lowers centre of gravity for lighter machine feeling
3. Allows easy & fast rider movements



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WR450F bodywork

All new compact slim / flat design body work:

- front & rear fenders
- rad shrouds
- fuel tank
- side panels & front number plate & headlight
- seat



Benefits of new body work:

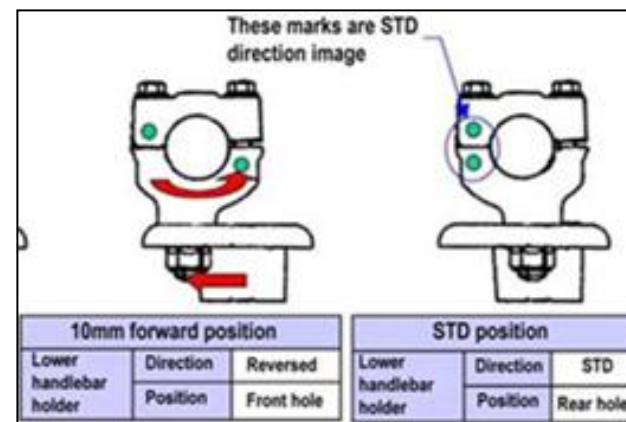
1. Fast & easy rider movements
2. Flat design allows rider to move closer to front wheel for better weight transfer
3. Lighter more compact body design with aggressive image
4. Less body means bike will keep looking good longer.



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The "EXTRAS"

- ProTaper handlebars
- Adj. handlebars (+10mm ... eccentric holders)
- Extra wide footpegs
- Dual stage washable air filter
- Excel rims (F&R)
- Tapered wheel spacers (easy wheel installation)
- Skid plate
- Sealed low maintenance battery
- Chain guide
- Premium Dunlop tires
- Tools free air box
- Rear disc & caliper protectors



Chassis key feature summary

Newly designed 35w headlight & number plate

Multi function digital meter

7.5 litre tank & internal fuel pump

Detachable rear sub frame

LED rear taillight

Slim / minimal bodywork

48mm adj. Kayaba SSS fork

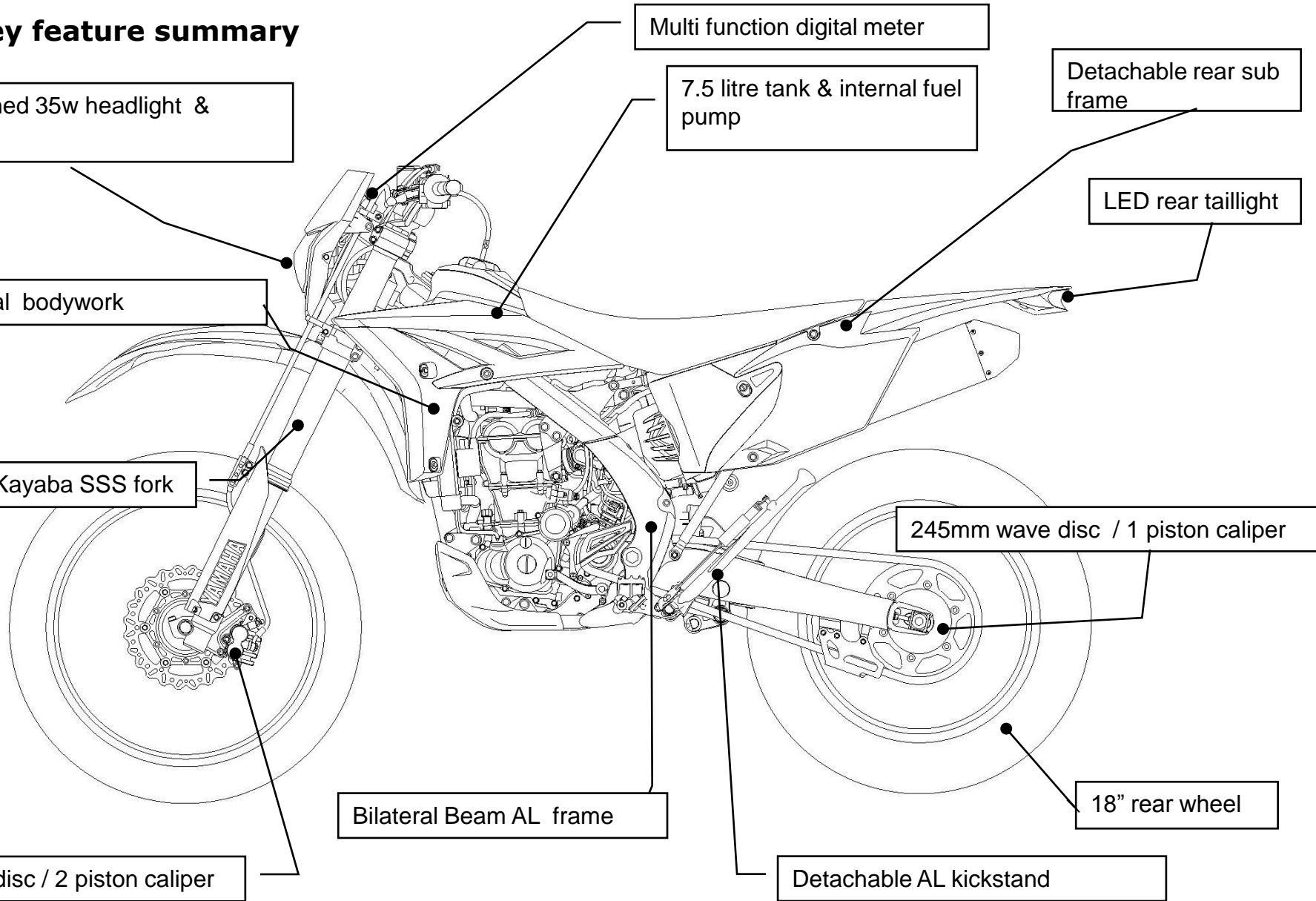
245mm wave disc / 1 piston caliper

18" rear wheel

Bilateral Beam AL frame

Detachable AL kickstand

250mm wave disc / 2 piston caliper





Thanks for listening



